DOCUMENT RESUME

ED 140 808 IR 004 879

AUTHOR Gale, Larrie E.
TITLE QAM: A Competency Based Need Assessment Methodology and Computer Program.
PUB DATE Apr 77
NOTE 8p.; Paper presented at the annual meeting of the Association for Educational Communications and Technology (Miami Beach, Florida, April 26, 1977)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Conceptual Schemes; Data Processing; *Educational Planning; Inservice Courses; Inservice Education; Job Skills; *Models; *Needs Assessment; Performance Based Education; Personnel Data; Personnel Evaluation; *Task Performance
IDENTIFIERS Likert Scale

ABSTRACT

A needs assessment methodology is described which can be used (1) to assess the competencies required for functioning in a particular position, (2) to provide data for planning inservice and preservice educational programs, (3) to assess job performance, and (4) to provide information for personnel planners. Quadrants are formed using four variables (ideal expectations, real perceptions, high importance, and low importance) with need being defined as the discrepancy between the real and the ideal. The functions of the computer program, developed to handle large quantities of data as well as examples of diverse uses of the QAM (Quadrant Assessment Model), are described. (STS)

**********
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
**********

ED140808

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

# QAM: A COMPETENCY BASED

# NEED ASSESSMENT METHODOLOGY AND COMPUTER PROGRAM

**Larrie E. Gale**

Associate Director, Instructional Services
University of Texas at San Antonio
San Antonio, Texas 78285

PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL HAS BEEN GRANTED BY

Larrie E. Gale

TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER

Paper for the Association of
Educational Communications and Technology,
Division of Instructional Development
Miami, Florida
April 26, 1977



IR004879

E/I

# QAM: A COMPETENCY BASED NEED ASSESSMENT METHODOLOGY AND COMPUTER PROGRAM

## INTRODUCTION

The concern for accountability and the use of the concept of competence as an attempt to provide accountability, have encouraged educational planners to employ need assessment techniques and methodologies. This paper describes one need assessment methodology that identifies areas of competence required for a specific position and which aligns the needed competence with preservice and inservice educational programs. A brief explication of the data generated by this model is included along with the results of the model's application in a variety of circumstances of formal research.

## THE NEED FOR DEFINITIONS AND A CONCEPTUALIZATION OF COMPETENCE

Few would question that competence is required for successful functioning in a specific position or role. A number of individuals concerned with competence and accountability have called for means to assess competence which will provide data bases from which educational programs can be planned.[1] However, before needed competence can be assessed it is necessary to clearly conceptualize the term "need" as well as the notion of competence. A reasonably comprehensive conceptualization of competence was developed in conjunction with this need assessment technique and reported in an earlier article. [2]

### A Definition of Need

As simplicity tends to breed flexibility, a simple definition of need was sought. The result was that, in this methodology, need was defined as the discrepancy between what is and what ought to be--the gap between what in reality is occuring and what ideally ought to be the case. This proved to be a very functional definition which generated a unique instrumentation and two important variables of the need assessment model.

### A Conceptualization of Competence

The conceptualization of competence used in the methodology ties competence to a specific position or role. That which binds competence to a role are the abilities, knowledge, skills, judgment, attitudes and values required for successful functioning in that position. A person who possesses the critically required abilities, knowledge, judgement, skills, attitudes and values, and uses them proficiently, is considered a competent individual. The conceptualization also assumes that competence is a molar concept composed of a complex of important, interrelated elements. Competence, then, is not broken down into "competencies" (the plural suggests two or more of the same thing, not parts of a whole), but is seen to consist of subparts or "areas of competence", which areas, when practiced at minimum levels and degrees of proficiency, constitute a competent individual. These areas of competence are further subdivided into elements or "components of competence" and the components, for purposes of the instrumentation used in the assessment, are described by statements which suggest the kind and degree of proficiency that an individual must possess for a specific task or function.

## THE METHODOLOGY

### Data the Methodology Promised to Generate

Obviously, this conceptualization of competence is closely related to role theory. It was felt that this methodology, if carefully designed, could produce data that would describe/reveal role conflict situations between a specified position and superordinates, as well as between that position and subordinates. Other data that the methodology promised to collect included:

The identification of crucial areas and components of competence required for successful functioning in a specific position or role

The provision of a data base for planning preservice educational programs

The provision of a data base for planning inservice educational programs

An assessment of the performance of persons currently functioning in a role or position

The provision of data for role clarification and role definition for persons functioning in a specific position through feedback to subordinates or superordinates that have false or conflicting role expectations

The provision of detailed role definitions for more complete job descriptions

The provision of criteria lists for personnel selection and for merit, pay or advancement considerations

**The Basic Elements of the Methodology**

The methodology has two major parts, the instrumentation and the need assessment model.

As the methodology was developed it was determined that data could be collected from persons familiar with or involved in the specified role or task and that these data then could be tabulated according to the definition of need and the conceptualization of competence mentioned above. Data were collected from subordinates, superordinates and the role incumbent. The definition of need required that two instrument forms be administered; one that would collect perceptions of reality of the present situation, and one that would collect expectations regarding what ideally ought to be occuring. The two instrument forms required by this methodology are the same instrument administered twice, each administration using a different mind set or perspective. The statements describing the functions of a specific role were not changed in the two instrument forms, but as the instrument was administered, special care was taken to establish the mind set so that the sample responded to the first instrument form in terms of what they perceived reality to be, and to the second in terms of what they ideally would expect to happen.

More specifically, the data collected on the instrument form descibing the real situation, (and therefore called the "Real" form), were the sample's perceptions of a person's functioning in a role and indicated the level of performance or proficiency for each task described by the statements on the instrument. The "Ideal" instrument form collected the sample's conceptualizations of role expectations and gave a measure of the degree of importance that a specific function ought to have as described by the statements on the instrument form.

**The Nature of the Data Collected**

When data were collected by the Ideal and Real instrument forms, the degree of Real and Ideal importance of different functions required quantification and were assigned values from an inverted Likert Scale of from five, "very important", to one, "not important". These values were then converted to T-scores for both instrument forms in an attempt to standardize them for comparison purposes. It was felt that an index of importance (the mean) and an index of consensus (the standard deviation) were functional and logical measures to use in standardizing response to the instrumentation.

The values thus derived were used in a variety of ways but their primary function was to rank order or prioritize each statement on the instrumentation and to statistically compare the rank ordering to determine if neighboring statements were defensibly dissimilar and were, therefore, of a different magnitude of priority. These values were also used to define high and low importance. This was done by cutting the values at 50, the defined mean, and labeling those values above 50 as "High", and those values below 50 as "Low". This definition of "High" and "Low" provides two more important variables of the methodology.

**Variables of the Quadrant Assessment Model**

Four variables of the need assessment methodology emerged. These came from the two instrumentation types and from the degree of importance of each item as viewed by the respondents. These variables are: high importance; low importance; ideal expectations; and real perceptions. (See Figure 1)

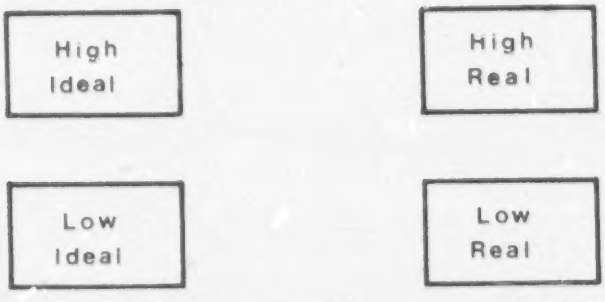


Figure 1: *The Variables of the Quadrant Assessment Model*

Later in the development of the methodology, these variables were compared and combined to form quadrants. The methodology then acquired the name of the Quadrant Assessment Model. To better understand how these variables combine and interrelate, it would be helpful to list the categories of data that the variables generated.

Statements on the Real instrument form that were seen to be of high importance (therefore called "High Real") suggested that a high degree of performance is successfully being accomplished by the role incumbent. The individual in the position is performing very well as perceived by those responding.

On the other hand, if statements fall into the "Low Real" category, they indicate that the perceived reality of an individual's proficiency is rather low--that a task or function is not being performed well.

When a statement is listed as important in the ideal instrument form ("High Ideal") it suggests that that task or function is a necessary part of the competence required for successful functioning in the position.

In contrast, when functions or tasks are rated as "Low Ideal", that is, they are ideally not important, the indication is that such elements of competence are not critical to successful functioning in the position, at least as perceived by the respondents.

## THE COMBINED VARIABLES FORM THE QUADRANTS OF THE QUADRANT ASSESSMENT MODEL

The Quadrant Assessment Model grew out of the need to logically compare and contrast these four categories of data such that need (the discrepancy between what occurs in reality and what ideally ought to occur) might be readily apparent. The Quadrant Assessment Model (or QAM) combines the high and low sets of perceptions-expectations from the Real and Ideal instrument forms and melds them into four quadrants. The model, therefore, is a two step process. The first step is a classification of variables as Real or Ideal, High or Low. The second step is the comparison of those variables; a comparison that identifies data as belonging to one of the model's quadrants.

The derivation of the Quadrant Assessment Model from the instrumentation and perception-expectation variables can be more readily communicated visually. In Figure 2, it can be seen that the instrumentation and perception-expectation variables have been combined and compared, and the comparisons then become, or form, the quadrants of the model.

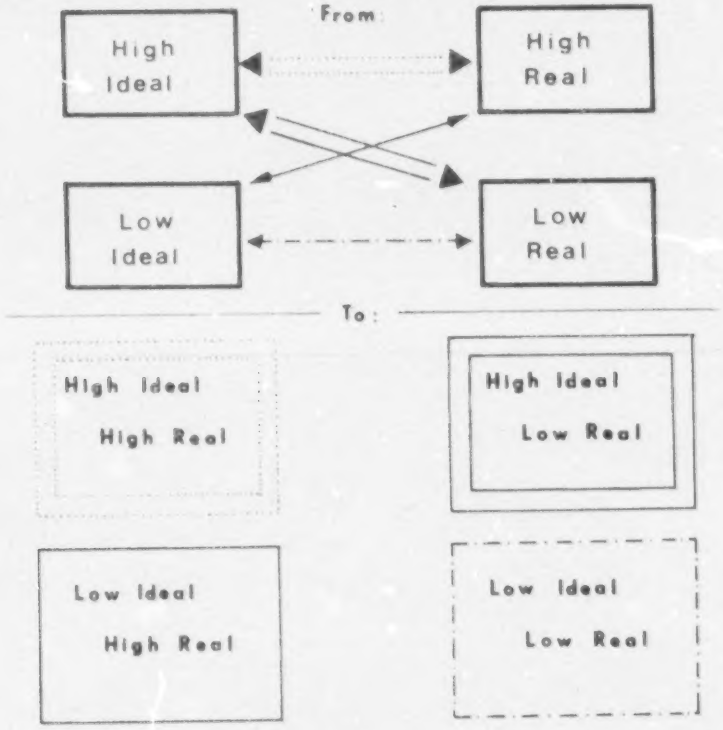


Figure 2: *Derivation of the Quadrant Assessment Model from Instrumentation and Perceptation Variables*

The data listed according to the quadrant logic of the model provide the following useful information.

### High Ideal-High Real

When the data are tabulated and an item on both the Real and Ideal instrument forms is found to rank high (above the means), then that item is listed in the High Ideal-High Real quadrant of the model. Such a listing of that statement describing a component of competence implies that: the component of competence described is important, ought to be possessed, and in fact is possessed by the person in the role specified; the person in the role is performing at a high level and degree of proficiency the task or function specified. Therefore, it seemed logical to assume that components of competence (items on the instrumentation) found in this quadrant provided a base from which parts of preservice educational programs could be planned. These same statements also provided job description information as well as criteria for the evaluation and selection of personnel to fill that specific position.

### High Ideal-Low Real

When identical statements on the two instrument forms are common to the High Ideal-Low Real quadrant, those statements are seen to imply that: the component of competence described ought to be possessed by the individual in the specified position but that it either was not possessed or was not proficiently employed at the level and degree expected. Therefore, it seemed logical to assume that the components of competence found in this quadrant of the model could provide a base from which parts of inservice educational programs could be planned. The components of competence showing up in this quadrant also appear to provide a base for the additional planning of preservice educational programs. Obviously, this quadrant of the QAM is the "need" quadrant. It reveals the discrepancy between what exists in practice and what ideally is expected to occur.

### Low Ideal-High Real

Those statements which are of low importance on the Ideal form and high importance on the Real form are found in the Low Ideal-High Real quadrant. Their location in this quadrant implies that the components of competence are possessed by the individual in the specified position but that they should not be possessed by him, at least not to that degree, according to the sample's perceptions-expectations. It seemed logical to assume that such components of competence are being overly emphasized, that they are relatively unimportant compared to the emphasis given them.

### Low Ideal-Low Real

When items on both instruments are rated low they fall into the Low Ideal-Low Real quadrant. Those statements falling into this quadrant imply that the components of competence described by them are of a low degree of importance to, and are not possessed by, the individual executing the role.

## APPLICATION OF THE QUADRANT ASSESSMENT MODEL

From the above quadrants, a number of different kinds of data can and have been generated in formal research. The quadrants identify those areas of competence that are critical, that are required for successful functioning in a position or role. The High Ideal-High Real and High Ideal-Low Real quadrants identify such areas of competence.

When individuals are identified in the collection of data, the QAM is capable of assessing the performance of persons presently functioning in a specific role and comparing the perceptions of performance between subordinates and superordinates. From these perceptions of an individual's performance and the ideal expectations of him, areas of existing and/or potential role conflict can be identified. Role conflicts between subordinates and the role incumbent, between superordinates and the role incumbent, and conflicting role expectations between subordinates and superordinates can all be identified using the QAM.

From a listing of the competence required for successful functioning in a position, job descriptions can be derived, as well as a list of criteria for successful functioning on the job. This same list can be used for personnel selection or for advancement considerations.

## THE QUADRANT ASSESSMENT MODEL'S APPARENT VERSATILITY

It appears from experience in using the QAM in a variety of situations and with different sample populations that it is a viable methodology that can be applied with success in divergent circumstances. It has functioned as a reliable need assessment vehicle discovering the discrepancy between what is and what ought to be. When the QAM was used in rural Bolivia, a series of validity checks were run. The study concluded that: the QAM is capable of identifying needs that are known to exist; data derived through the QAM methodology are dependable; and that such data are useful in planning educational programs.[3]

A need assessment of educational goals was conducted in the Edgewood Independent School District, a bilingual-bicultural school district located in San Antonio, Texas. The QAM functioned similarly in this different situation and its use has become an annual project in the district. Needs changing from year to year within schools and programs are monitored using the QAM. [4]

The QAM was also used in that district to assess the competence of principals and other leaders. The QAM produced data that provided bases for the planning of general inservice programs for the total staff and personalized inservice programs for specific individuals. In addition, the data generated by the QAM revealed role conflicts between superordinates and subordinates as well as between the role incumbent and his/her superordinates or subordinates. From these data, the functioning of different roles were more clearly defined and change in the functioning of specific individuals was noted in a follow-up study the next year. [5]

The QAM was also modified and used in determining the relevant language dominance of Spanish/English speaking bilingual students. For this study the Quadrant Assessment Model was taken out of its normal enviornment of specifying role competence to determining the degree of usage and level of proficiency students exhibited speaking Spanish and English. The relative language ability and language dominance were plotted for each student following QAM logic. From these data, language dominance profiles for individual students, for classes and for entire schools were developed.

## THE COMPUTER PROGRAM

In order to process large quantities of data according to QAM logic, it was necessary to develop a computer program. The program provides a number of subroutines which include frequency distributions, prioritization lists and correlation coefficients.

The program sorts for pre-selected variable groups and prints out the following information: demographic data by numbers and percents responding as well as the mean and standard deviation for each demographic item; frequency distributions for each item for both Ideal and Real instrument forms, listing these together for ready comparison; a combined, weighted ranking list that prioritizes items; a simple rank ordering of items for both instrument forms in a side-by-side listing at the same time running t-tests in an attempt to discover which items are defensibly dissimilar to their neighbors; and a listing of items in the quadrants of the QAM.

A final subroutine computes W-Concordance correlation data so that relative consensus of rankings across variable groups might be determined. The program also provides listings that make it possible to determine absolute and relative consensus of the quadrant listings for each item on the instrumentation across all variable groups.

## SUMMARY

It is felt from experience with the variety of applications of the Quadrant Assessment Model in formal research that the simplicity of the logic employed is such that it readily lends itself to different situations and to different enviornments. It appears that the logic is simple enough to be generalizable to a wide range of possible applications where the discovery of need (or data comparing opinions or performance) is required.

## END NOTES

1 Donald Brandewie, Thomas Johnson and J. Lloyd Trump, "The Preparation and Development of Secondary School Administrators: A Summary", *NASSP Bulletin,* (March, 1972), 24-41.

T. Joseph Sheehan, "Towards a System of Professional Education", *The Irish Journal of Education,* (Vol. I, No. 2, 1967), 141-149.

Eddy J. Van Meter, "The New Competency Based Training Movement in Educational Administration", (Paper presented at the National Association of Secondary School Principals convention , February 1973, Dallas, Texas).

Lloyd E. McCleary, "Competency Based Education: What Is It and What Does It Mean for Professional Preparation?" (Paper presented at the NCPEA conference , Bellingham, Washington, 1973).

2 Larrie E. Gale and Gaston Pol, "Competence: A Definition and Conceptual Scheme", *Educational Technology,* (June 1975), 19-25.

3 Larrie E. Gale, "Competence Required for the Principalship: A Methodology Applied to the Rural Bolivian Setting", (Unpublished doctoral dissertation, University of Utah, Salt Lake City, Utah, April 1973), 133-135, 147. Also see similar conclusions in a parallel study, Gaston Pol, "Competence Required for the Principalship: A Methodology Applied to the Urban Bolivian Setting", (Unpublished doctoral dissertation, University of Utah, Salt Lake City, Utah, June 1973).

4 Gaston Pol, "Quarterly Report to the Director of E.S.P.", Edgewood Independent School District, San Antonio, Texas, December 1973.

Gaston Pol, "Needs Assessment of Educational Goals", (Report to the Steering Committee of Edgewood Independent School District, San Antonio, Texas, September, 1975).

5 Gaston Pol, "The Evaluation of Principals", (Yearly Report of Level I Evaluation, E.S.P., Edgewood Independent School District, San Antonio, Texas,January 1974, October 1975, and August 1976).

Gaston Pol, "Competence Required for the Principalship: A New Bilingual Methodology of Self Assessment and Community Participation", (Paper presented at the Fourth International Bilingual, Bicultural Conference, San Antonio, Texas, May 1976).

Gaston Pol, "Evaluation of Principals: A New Methodology with Community Participation", *CCBC N..ebook: The Competency Based Curriculum,* (Vol. V, No. 4, July 1976).